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EXAMINER

HARPER, HOLLY R

ART UNIT	PAPER NUMBER
2879	

DATE MAILED: 10/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/897,738

Applicant(s)

SUNDAHL, ROBERT C.

Examiner

Holly R. Harper

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) 23-39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-22,30 and 32-38 is/are rejected.
- 7) ☒ Claim(s) 31 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

The Amendment, filed on 8/19/2003, has been entered and acknowledged by the Examiner.

Claims 30-38 have been entered.

Claims 1, 13, 17-18, and 21 have been amended.

Claims 23-29 have been canceled.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-12, 14, 17, 19-21, 30, and 32-34 are rejected under 35 U.S.C. 102(e) as being anticipated by Roach et al (USPN 6,274,978 B1) hereinafter "Roach".

In regard to claim 1, the Roach reference discloses an OLED display (Column 3, Lines 50-51) with a back panel (Figure 3, Element 210). The back panel is made of a ceramic material with electrical conductors. The back panel is laminated to a metal base sheet, which is a heat dissipating structure (Column 6, Lines 40-55). The front panel is parallel to the back panel

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(Figure 3, Element 110). There is an array of OLED pixels between the front and back panel (Figure 3, Element 150). There is a plurality of thermally conductive elements between the OLED pixels and the back panel and distributed through the array of OLED pixels (Figure 3, Element 232). Each thermally conductive element is positioned between the back panel and a thermally conductive cathode line (Figure 3, Element 140). Due to the conductive properties of the cathode line and the conductive element, heat generated by the OLED pixels is dissipated through the conductive line, thermally conductive elements, the back panel, and to the heat dissipating structure (metal base plate).

In regard to claim 2, the Roach reference discloses that each pixel comprises a plurality of sub-pixel regions that emit different colors of light (Column 3, Lines 41-49).

In regard to claim 3, the Roach reference discloses that the thermally conductive elements are solder joints (Column 4, Line 4).

In regard to claim 4, the Roach reference discloses that there is at least one solder joint positioned between each OLED pixel and the back panel (Figure 3).

In regard to claims 5 and 10, the Roach reference discloses that each pixel has at least one cathode contact (Figure 3, surface of Element 140) and a solder joint for each pixel on the cathode contact between the pixel and the back panel (Figure 3, Element 232).

In regard to claims 6 and 11, the Roach reference discloses that each pixel has at least one anode contact (Figure 3, Element 162) and a solder joint for each pixel on the anode contact between the anode contact and the back panel (Figure 3, Element 234).

In regard to claims 7 and 12, the Roach reference discloses conductive bumps between the pixels and the back panel (Column 4, Line 4).

In regard to claim 8, the Roach reference discloses that the array of pixels is divided into a plurality of subsets of adjacent pixels (Column 3, Lines 40-47).

In regard to claim 9, the Roach reference discloses that there is at least one thermally conductive element positioned between each pixel subset and the back panel (Figure 3).

In regard to claim 10, the Roach reference discloses that each pixel subset includes a pixel having at least one cathode contact (Figure 3, Element 140). There is a thermally conductive element for each pixel subset on the cathode contact (Figure 3, surface of Element 140) between the pixel subset and the back panel (Figure 3, Element 232).

In regard to claim 14, the Roach reference discloses an epoxy material coating the light emitting elements (Figure 3, Element 150 and Column 8, Lines 36-44).

In regard to claim 15, the Roach reference discloses that the back substrate is made of a ceramic material on top of a metal base sheet (Column 6, Lines 40-48), which serves as a heat fin.

In regard to claim 17, the Roach reference discloses an OLED display (Column 3, Lines 50-51) with a back panel (Figure 3, Element 210). The back panel is made of a ceramic material with electrical conductors. The back panel is laminated to a metal base sheet, which is a heat dissipating structure (Column 6, Lines 40-55). The front panel is parallel to the back panel (Figure 3, Element 110). There is an array of OLED pixels between the front and back panel (Figure 3, Element 150). The array of pixels is divided into a plurality of sub-sets (Column 3, Lines 41-49). There is a plurality of solder joints between the pixels and the back panel and distributed through the array of pixels (Figure 3, Element 232). The solder joints are thermally conductive elements (Column 4, Line 4). There is a solder joint between each pixel subset and

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the back panel (Figure 3, Element 232). Each solder joint is positioned between the back panel and a thermally conductive cathode line (Figure 3, Element 140). Due to the conductive properties of the cathode line and the conductive element, heat generated by the OLED pixels is dissipated through the conductive line, thermally conductive elements, the back panel, and to the heat dissipating structure (metal base plate).

In regard to claim 19, the Roach reference discloses that each pixel comprises a plurality of sub-pixel regions that emit different colors of light (Column 3, Lines 41-49).

In regard to claim 20, the Roach reference discloses that solder joints, conductive bumps, connect to the back panel (Figure 3).

In regard to claim 21, the Roach reference discloses that the back substrate is made of a ceramic material on top of a metal base sheet (Column 6, Lines 40-48), which serves as a heat fin.

In regard to claim 30, the Roach reference discloses an OLED display (Column 3, Lines 50-51) with a back panel (Figure 3, Element 210). There is at least one electrical interconnection line formed on the back panel (Figure 3, Element 230). The front panel is parallel to the back panel (Figure 3, Element 110). There is an array of OLED pixels between the front and back panel (Figure 3, Element 150). It is well known in the art that the pixels emit light when an electrical current is conducted through the pixel between the anode (Figure 3, Element 120) and cathode lines (Figure 3, Element 140). Each cathode line is electrically connected to the electrical interconnection lines of the back panel (Figure 3, Element 230) by thermally conductive elements (Figure 3, Element 232) formed at each pixel and positioned between the cathode line and the electrical interconnection line.

In regard to claim 32, the Roach reference discloses that each pixel comprises a plurality of sub-pixel regions that emit different colors of light (Column 3, Lines 41-49).

In regard to claim 33, the Roach reference discloses that the thermally conductive elements are solder joints (Column 4, Line 4).

In regard to claim 34, the Roach reference discloses at least one cathode contact (Figure 3, the surface of Element 140) is formed between the cathode line (Figure 3, Element 140) and the electrical interconnection line of the back panel (Figure 3, Element 230). There is a solder joint (Figure 3, Element 232) for each pixel on the cathode contact between the pixel and the back panel (Figure 3).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 13 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roach (USPN 6,274,978 B1).

The Roach reference discloses a thermally conductive back panel made from a ceramic substrate and electrical connectors. The ceramic material is not actually conductive. However, it is noted that the inclusion of a conductive ceramic substrate is not shown to solve any problems or yield any unexpected results that are not within the scope of Roach's OLED display.

Accordingly, the inclusion of a conductive ceramic substrate is considered to be an obvious matter of design choice.

5. Claims 16 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roach (USPN 6,274,978 B1) in view of Patel (USPN 5,396,403).

In regard to claims 16 and 22, the Roach reference discloses an OLED display with a heat sink but does not specify the use of a cooling fan. The Patel reference teaches that cooling fan can be attached to a heat sink of an integrated circuit on a substrate. The cooling fan increases the rate of convective heat transfer (Column 5, Lines 10-12). Thus, it would have been obvious at the time the invention was made to a person having ordinary skills in the art to incorporate a cooling fan on the heat sink, as taught by Patel, to increase the rate of convective heat transfer.

6. Claims 35-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roach (USPN 6,274,978 B1).

In regard to claim 35, the Roach reference discloses an OLED display (Column 3, Lines 50-51) with a back panel (Figure 3, Element 210). There is at least one electrical interconnection line formed on the back panel (Figure 3, Element 228). The front panel is parallel to the back panel (Figure 3, Element 110). There is an array of OLED pixels between the front and back panel (Figure 3, Element 150). There is an OLED pixel centrally located in a non-edge location of the array. There is a thermally conductive element (Figure 3, Element 234) that connects the anode contact (Figure 3, Element 162) to the electrical interconnection of the back panel (Figure 3, Element 228).

Roach discloses the claimed invention except for the limitation of the anode contact located at a non-edge location. It has been held that rearranging of parts of an invention involves

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only routine skills in the art. Thus, it would have been obvious to one having ordinary skills in the art the time the invention was made to have an anode connection not at the edge of the array, since rearrangement of parts of an invention is considered within the skills of the art.

In regard to claim 36, the Roach reference discloses that there is a cathode contact (Figure 3, surface Element 140), located on a centrally located pixel that has a second thermally conductive element (Figure 3, Element 232) formed on the cathode contact to electrically connect the cathode contact to the electrical connection line of the back panel (Figure 3, Element 230).

In regard to claim 37, the Roach reference discloses that each pixel comprises a plurality of sub-pixel regions that emit different colors of light (Column 3, Lines 41-49).

In regard to claim 38, the Roach reference discloses that the thermally conductive elements are solder joints (Column 4, Line 4).

Allowable Subject Matter

7. Claim 31 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 31, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 31, and specifically comprising the limitation that each anode line is electrically connected to at least one of the electrical interconnection lines of the back panel by thermally conductive elements.

Response to Arguments

8. Applicant's arguments filed 8/19/2003 have been fully considered but they are not persuasive.

In regard to applicants claim that Roach has a metal base plate laminated to the ceramic substrate but not to facilitate heat dissipation, the examiner respectfully disagrees. The metal plate would help dissipate heat. The ceramic substrate has electrical connectors that would help conduct the heat to the metal base plate.

In regard to applicants claim that Roach does not address the issue of heat dissipation, the examiner respectfully agrees. However, the elements in Roach's OLED display would serve the function of dissipating heat and therefore meets all the structural limitations of the applicants claims.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Wierer, Jr et al. (USPN 6,514,782) discloses an LED display with solder bumps connecting the electrodes to the back substrate.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Holly Harper whose telephone number is (703) 305-7908. The examiner can normally be reached on Monday-Friday from 8:30 AM to 5:00 PM.

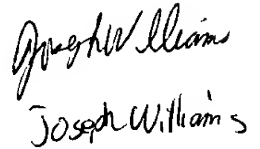
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel, can be reached on (703) 305-4794. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7382.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



Holly Harper
Patent Examiner
Art Unit 2879



Joseph Williams